REMARKS/ARGUMENTS

Applicant has carefully reviewed the Office Action dated March 7, 2006. Reconsideration of the Examiner's rejection of the claims in their amended form is respectfully requested. A total of 25 claims remain in the case. Claim 1 is currently amended further to limit the range of the weight percent of the organic blowing agent in the foamed cellular particles of the invention as ranging between 2.5 and 3.5 weight percent and to recite that the foamed cellular particles have an extended shelf life compared to the expandable particles. This latter recital originally appeared in claim 25, which is now canceled without prejudice. Claims 1, 3, 6, 9, and 26 were amended previously. Claims 4, 5, 7, 8, 10-24 and 49 remain as originally filed.

Amended claim 1 now recites that the amount of the organic blowing agent in the foamed cellular particles ranges between 2.5 and 3.5 weight percent and that the foamed particles have an extended shelf life. Additionally, the characteristics of the foamed cellular particles are such that conventional equipment can be used in expanding and molding processes used to form an article. This feature also appears in claim 1.

Claims 27-48 and 50 had been withdrawn in view of a restriction requirement. Claims 27, 29 and 30 are amended once again herein to be commensurate with the amended claim 1 of this case. Applicants respectfully request that the withdrawn claims 27-48 and 50 be rejoined in this application.

Claim Rejection under 35 U.S.C. 112

Claim 25 was rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards at the invention. Claim 25 is now canceled without prejudice and the subject matter of this claim now appears in Claim 1 as amended. Therefore, Applicant requests that the rejection of the claims based on this rejection be withdrawn.

Claim Rejections under 35 U.S.C. 103 (a)

Claims 1, 3-26 and 49 were rejected under 35 U.S.C. 103(a) as being

unpatentable over WO 00/15703 to NOVA Chemicals of record. This reference is said to disclose foamed pre-expanded particles in the comparative experiment. These foamed pre-expanded particles are said by the Examiner as having a bulk density of 550 kg/m^3 after being pre-expanded from the original expandable (but not pre-expanded particles). The reference is further said to disclose the possibility of adding co-monomer, nucleating agent, coating the particles, etc. These particles which have 5.9 wt % of pentane (after being pre-expanded from the particles originally having 6.2 wt % pentane) are further expanded in conventional equipment to form an article or an expanded particle with the bulk density of 14.9 kg/m^3. The Examiner further states that the difference between the claimed foamed pre-expanded particles and the particles disclosed by the reference is that the amount of the organic blowing agent, i.e. pentane, in the disclosed pre-expanded particles is slightly higher than the upper claimed limitation, i.e. 5.9 wt% as compared to the upper claimed limit of 5 wt%.

In this rejection the Examiner states that reducing the amount of the blowing agent in the pre-expanded particles (by impregnating the original non-expanded particles with smaller amounts of pentane) would have been clearly obvious from the teachings of the reference expressly disclosing (all illustrative and comparative experiments) that the amount of the blowing agent in the original expandable particle governs the ability of the pre-expanded particles to be expanded to different ratios and resulting in final product of different densities.

Applicant has now amended Claim 1 to further limit the range of the organic blowing agent in the foamed cellular particles as having a lower limit of 2.5 wt % and an upper limit of 3.5 wt %. Applicant wishes to bring to the Examiner's attention the fact that this limited range was originally claimed in the claims, particularly in claims 3 and 4. Page 12, lines 9-10 of the specification recite that this is the preferred range of organic blowing agent, i.e. pentane, in the foamed cellular particles. Page 13 beginning at line 7 states that the conventional expandable particles, which contain from about 3.5 wt% to 7.2 wt% pentane may have an effective shelf life of about 3 months, and that there is evidence as demonstrated by some of the examples

in the application that the foamed cellular particles of the invention have a longer shelf life than the conventional expandable particles.

As evidenced by the enclosed Declaration under 37 C.F.R. 1.132 submitted by Paul Arch, this range of 2.5 wt% to 3.5 wt% has recently become very critical in view of some environmental regulations being enacted and/or enforced in the State of California. This claimed range may become the acceptable range for converters located in the areas that are tightening or enforcing their local regulations.

Page 13 of the specification also states that the shelf life of the foamed cellular particles is important in that if there are delays at both the polymer producer's site and at the foam molder's site, i.e. the converter's site. If the shelf life of the foamed cellular particles is longer compared to that of the conventional expandable polymer particles, then there may be sufficient blowing agent in the foamed cellular particles. If there is sufficient blowing agent in the foamed cellular particles, then the foamed cellular particles can be pre-expanded and molded without the need to impregnate the particles with an additional amount of blowing agent.

The 2.5 wt% to 3.5 wt % range for the organic blowing agent in the foamed cellular particles is an ideal range and becomes critical in that the VOC emissions in the plant of the foam molder are reduced even further compared to the instance where the weight percentage upper limit range of the organic blowing agent were greater than 3.5 wt%. Applicant calls the Examiner's attention to page 14 of the specification of the present application. Not only can the foam molder or converter reduce the VOC emissions to an optimal level, the foam molder or converter can also increase its production capacity of the foamed cellular particles and still fall under the local regulatory limits for VOC emissions. A further advantage of the 2.5 wt % to 3.5 wt % organic blowing agent range in the foamed cellular particles is that the converter may not have to incur additional costs associated with pentane collection equipment (e.g. collecting emissions from end-use molded foam articles) in order to comply with the local regulatory emission standards for the respective geographical area.

Therefore, in summary, the foamed cellular particles as now claimed in Claim 1 present several important novel distinctions. These are: a) the

foamed cellular particles contain an organic blowing agent ranging from 2.5 wt % to 3.5 wt % (the advantages of which are discussed in the preceding paragraphs); b) the foamed cellular particles for a predetermined time at room temperature have a blowing agent weight loss 15% to 50% lower compared to the expandable particles in the same predetermined time at room temperature; c) the shelf life of the foamed cellular particles is extended (the advantages of which are also discussed in the preceding paragraphs); and d) the foamed cellular particles can be used in conventional equipment to form foam articles having a bulk density ranging between 0.50 pounds per cubic foot and 6.0 pounds per cubic foot (which, as discussed, in the previous amendment dated December 19, 2005 are bulk densities of commercial interests).

The Applicant also calls the Examiner's attention to pages 33 – 34 of the specification of the present application, which discuss the shelf life of the foamed cellular particles of the invention. The extended shelf life is hypothesized to occur for the following reasons: 1) Since there are lower pentane levels in the foamed cellular particles there is less driving force for diffusion of the pentane out of the cells of the particles. (If the pentane level is even lower than 5.9 wt % and still even lower than 5.0 wt %, i.e. 3.5 wt %, then this driving force is further lessened in the foamed cellular particles. 2) Since the foamed cellular particles are larger than the conventional expandable particles, the mean path for diffusion of the pentane through the particles is longer. That is, for a predetermined time, at room temperature the foamed cellular particles have a blowing agent weight loss 15% to 50% lower than that of the expandable particles in the same time at room temperature. The foamed cellular particles of the invention need to have enough pentane so that the shelf life of the particles is extended and these particles can be converted into commercial foamed articles by using conventional equipment but not so much pentane that the allowance for the VOC emissions will be exceeded. The foamed cellular particles of the claimed invention as now claimed now provide this ideal range, i.e. 2.5 wt % to 3.5 wt % of an organic blowing agent.

These several factors of the foamed cellular particles of the claimed invention, as particularly now recited in amended claim 1 are tied together to

distinguish them from the particles of the Examples 1-6 and the Comparative Example of the WO00/15703 reference. This reference does not teach or disclose the foamed cellular particles of the claimed invention.

For the reasons given herein above and those contained in the attached Declaration under 37 C.F.R. 1.132, Applicant submits that the claimed invention as recited in the claims is not obvious in view of the WO00/15703 reference, and therefore, that this rejection of the claims be withdrawn.

Response to Arguments

Applicant notes the Examiner's arguments presented in this section of the Office Action. Applicant submits that the patentability of the claims given herein above applies here with equal force, and that the Applicant has now given credible reasons and/or evidence for the importance of the volatile organic blowing agent being in the range of from 2.5 wt % to 3.5 wt % in the foamed cellular particles of the invention.

In view of the above arguments, Applicant respectively requests that the claims as they now stand be allowed.

Summary and Conclusion

The attached Declaration under 37 C.F.R. 1.132 provides factual evidence for the importance of the claimed volatile organic blowing agent range. Additionally, Applicant has shown that the claimed invention as particularly claimed in claim 1 as now amended is not obvious in view of the WO 00/15703 reference.

This is a non-fee amendment.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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